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Successful macroscopic penile replantation in a 4-year-old child: a case report

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Abstract

Background Penile amputation is a rare urological emergency that requires prompt surgical intervention and comprehensive medical evaluation. Microsurgical replantation is considered the preferred approach when feasible; however, macroscopic repair may provide satisfactory outcomes in resource-limited settings. Reports of successful penile replantation in very young children remain exceedingly rare.

Case presentation A 4-year-old boy presented with near-complete penile amputation. Following initial resuscitation and stabilization, surgical re-implantation of the penis and urethral reconstruction were performed. Due to the unavailability of microscopic equipment, neurovascular anastomosis of the penile dorsal complex could not be carried out. A Foley catheter was maintained for a relatively prolonged period postoperatively for 20 days. Despite the absence of microsurgical repair, the patient demonstrated satisfactory early cosmetic appearance and normal voiding behavior during 38-month follow-up.

Conclusions This case suggests that macroscopic penile replantation may provide favorable cosmetic and urinary outcomes in selected pediatric patients when microsurgical facilities are unavailable. Prompt intervention and meticulous surgical reconstruction remain critical for achieving satisfactory results. However, longer-term objective functional evaluation into adolescence remains necessary.

Keywords Penile amputation, Penile re-implantation, Microscopic surgery, Case report

Introduction

Penile injuries are rare in children. Penile amputation is a rare genitourinary injury worldwide, with most studies on this condition including a limited number of patients [1]. The severity of penile injuries ranges from superficial lacerations to total amputations of the penis. Such injuries can result from gunshots, animal bites, self-mutilation, assault, or complications following circumcision [2]. Herein, we report a case of total penile amputation in a 4-year-old patient with an unknown etiology that was successfully managed by macroscopic replantation.

To the best of our knowledge, reports of successful penile replantation in very young children remain scarce [3–9], particularly those describing macroscopic

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replantation without neurovascular anastomosis. To place the present case in the context of the existing literature, previously published pediatric cases of penile amputation and replantation are summarized in Table 1. These reports underscore both the rarity of this injury and the limited availability of long-term functional follow-up, emphasizing the clinical relevance of the present case.

The present case is particularly noteworthy because satisfactory cosmetic and functional outcomes were achieved despite prolonged ischemia time and lack of microsurgical facilities in a developing country. In addition, the case highlights the importance of multidisciplinary psychological and social evaluation in pediatric genital trauma.

Case report

A 4-year-old child was referred to the emergency department of our center with a penile amputation that had occurred approximately nine hours before admission. According to his parents, he had lost a substantial amount of blood. The patient was initially admitted to a local hospital, where a 10-Fr Foley catheter (FC) was inserted through the remaining proximal part of the penis into the bladder. He was promptly referred to the trauma center at Shahid Bahonar Hospital, affiliated with Kerman University of Medical Sciences.

Parents reported that the child had amputated his penis using a sharp kitchen knife. They also stated that he had injured his scrotum a few months earlier. The patient had a past medical history of epilepsy during infancy, for which antiepileptic medications had been prescribed for approximately three months and discontinued after symptom resolution. There was no known family history of psychiatric, neurologic, or genetic disorders. Developmental milestones had reportedly been normal. Psychosocial evaluation was later requested because of concerns regarding possible child abuse and the psychological impact of the injury.

On arrival, the patient was hemodynamically stable but appeared pale, with a blood pressure of 100/65 mmHg and pulse rate of 80 beats/min. Laboratory testing demonstrated anemia with a hemoglobin level of 5.6 g/dL, prompting transfusion of 150 mL of packed red blood cells. Penile amputation was performed at the base of the shaft, with the remaining organ attached via a thin ventral skin bridge. Furthermore, a scrotal laceration was noted (Fig. 1). Urine appeared clear with no signs of hematuria.

Diagnostic and therapeutic management was challenging because of the patient's young age, limited availability of microsurgical facilities, and concerns regarding

Table 1 Published pediatric reports of penile amputation and replantation, and comparison with the present case

ID	Author (Year)	Age	Level of amputation	Ischemia time	Surgical technique	Follow-up	Main outcome
1	Banihani et al. (2014) [3]	7-day neonate	Complete penile shaft	1 h	Microsurgical replantation with vascular anastomosis	8 months	Good cosmetic result; strong urinary stream; normal VCUG
2	Khaireddine et al. (2014), Case 1 [4]	5 years	Complete glans	30 min	Macroscopic reattachment	2 years	Good cosmetic outcome; preserved sensation and erections; no urethral stricture or fistula
3	Khaireddine et al. (2014), Case 2 [5]	3 years	Complete glans	2 h	Macroscopic reattachment	13 months	Good cosmetic outcome; preserved sensation and erections; no urethral stricture or fistula
4	Patial et al. (2017) [6]	9 years	Complete penile shaft	20 h	Microsurgical replantation	12 days	Complete necrosis despite revascularization; replantation failed because of complete necrosis
5	Soltani et al. (2020) [7]	4 years	Complete glans with urethral injury	2 h	Macroscopic replantation	3 months	Reversible glans ischemia successfully treated with pentoxifylline; normal voiding and uroflowmetry.
6	Tawaranurak et al. (2023) [8]	4 years	Total penile shaft	16 h, 43 min	Microsurgical replantation	6 months	Excellent cosmetic outcome; normal voiding (Qmax 21 mL/s); preserved penile sensation and morning erections; no fistula, urethral stricture, penile deformity, or erectile dysfunction.
7	Mishra et al. (2026) [9]	3 years	Total subcoronal amputation	≈8 h	Composite graft with dorsal venous anastomosis (arterial repair not feasible)	20 days	Successful graft take, normal urinary stream, viable glans after debridement.
8	Present case	4 years	Near-total penile shaft amputation	9 h	Macroscopic replantation without neurovascular anastomosis	38 months	Stable cosmetic appearance; normal voiding according to parental report; spontaneous penile erections reported by parents; no fistula or significant scar contracture



Fig. 1 Complete transverse transection of the urethra and corporal bodies, consistent with AAST grade IV injury

possible non-accidental trauma requiring multidisciplinary psychological evaluation.

Owing to the lack of microsurgical repair facilities in our department, macroscopic replantation was planned. After explaining the possible risks and complications to parents, formal written consent was obtained. Prophylactic intravenous (IV) cefazolin was administered, and the patient, whose vaccinations were up-to-date, was transferred to the operating room. Postoperatively, prophylactic intravenous cefazolin was administered according to the pediatric dosing protocol of the institution. The patient remained on complete bed rest for three days, and the Foley catheter was maintained for 20 days. No imaging studies were obtained before the Foley catheter removal. The catheter was removed based on clinical assessment, in the absence of urinary leakage, wound complications, or other signs suggestive of urethral disruption. Sodium valproate and risperidone were initiated following pediatric neurologic and psychiatric consultation.

The patient was placed in the supine position, and the Foley catheter was removed. After proper preparation and draping, the surgical field was irrigated with sterile saline solution. Under general anesthesia, examination revealed a complete transverse transection of the urethra and corporal bodies, consistent with grade IV injury according to the American Association for the Surgery of Trauma (AAST) classification (Fig. 1).

An 8-Fr Nelaton catheter was passed through the distal penile stump and proximal urethral segment into

the bladder. Minimal debridement was performed, and the urethra was spatulated. Four interrupted 5 – 0 Vicryl sutures were placed through the urethra and left untied for approximation (Fig. 2). Two interrupted 6 – 0 Vicryl sutures were then placed through the penile septum at the medial aspects of the corporal bodies and left untied as noted above. The Nelaton catheter was removed and replaced with a 10-Fr Foley catheter. The urethra and corpora were reapproximated without mechanical tension.

The tunica albuginea was repaired circumferentially using interrupted 5 – 0 Vicryl sutures, with care taken to avoid injury to the dorsal neurovascular complex (Fig. 3). Due to the small size of the structures and the unavailability of microscopic equipment, no anastomosis of the dorsal neurovascular bundle was performed. The scrotal laceration and penile skin were then closed using interrupted 4 – 0 Vicryl sutures (Fig. 4).

Postoperatively, the patient was maintained on complete bed rest for three days. A small area of glans necrosis was observed, which was resolved by daily irrigation with sterile saline (Figs. 5 and 6). In addition, the patient's postoperative course was uneventful. The patient was discharged eight days after the surgery, and the Foley catheter was removed 20 days later (Fig. 6). No additional imaging studies or uroflowmetry were performed because the family was unable to return for objective investigations owing to severe socioeconomic limitations and residence in a remote nomadic-rural area.

Pediatric neurologic consultation was sought because of a previous history of seizures, for which sodium

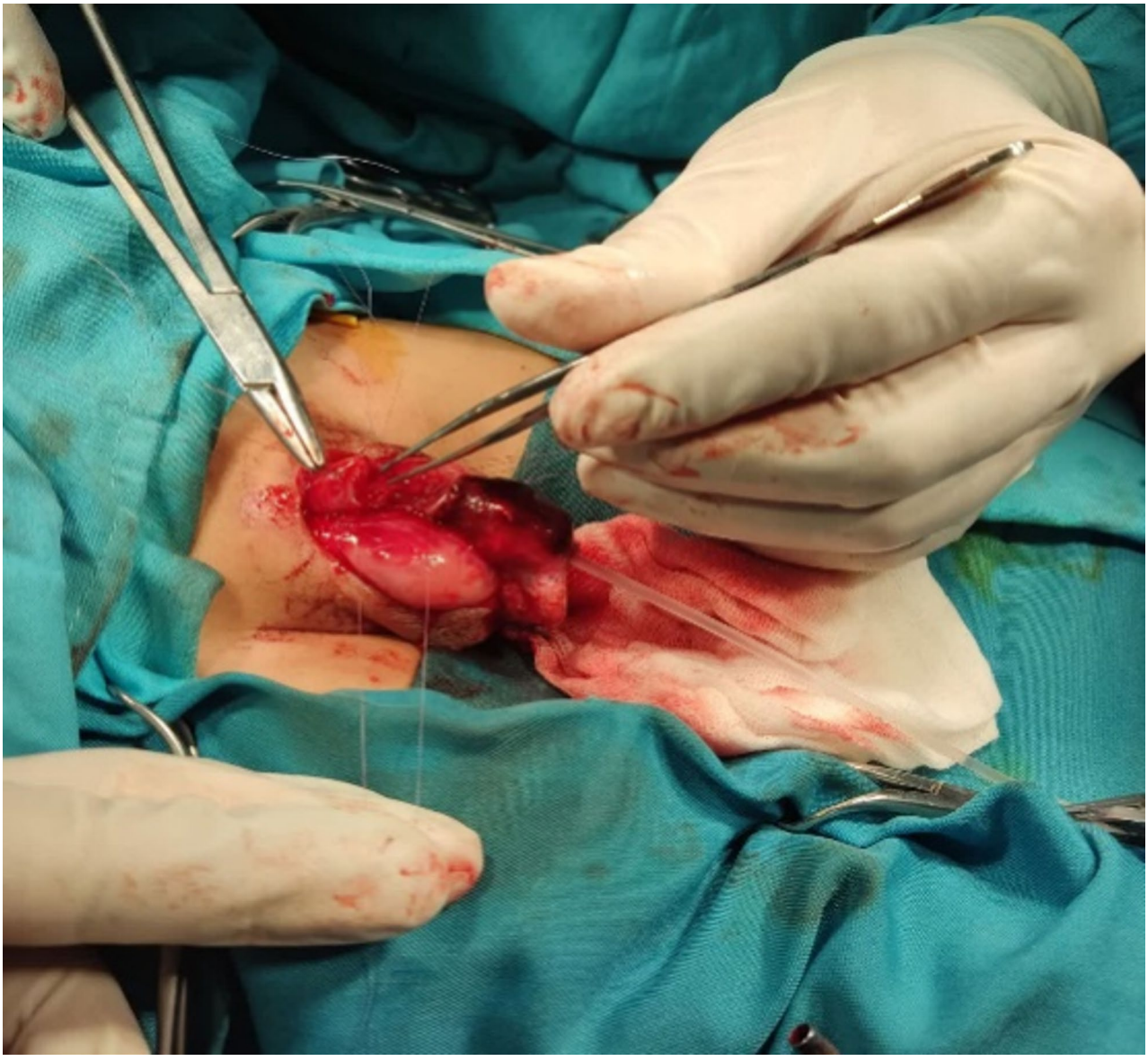


Fig. 2 Placing four interrupted 5-0 Vicryl sutures through the urethra and leaving them untied for later approximation

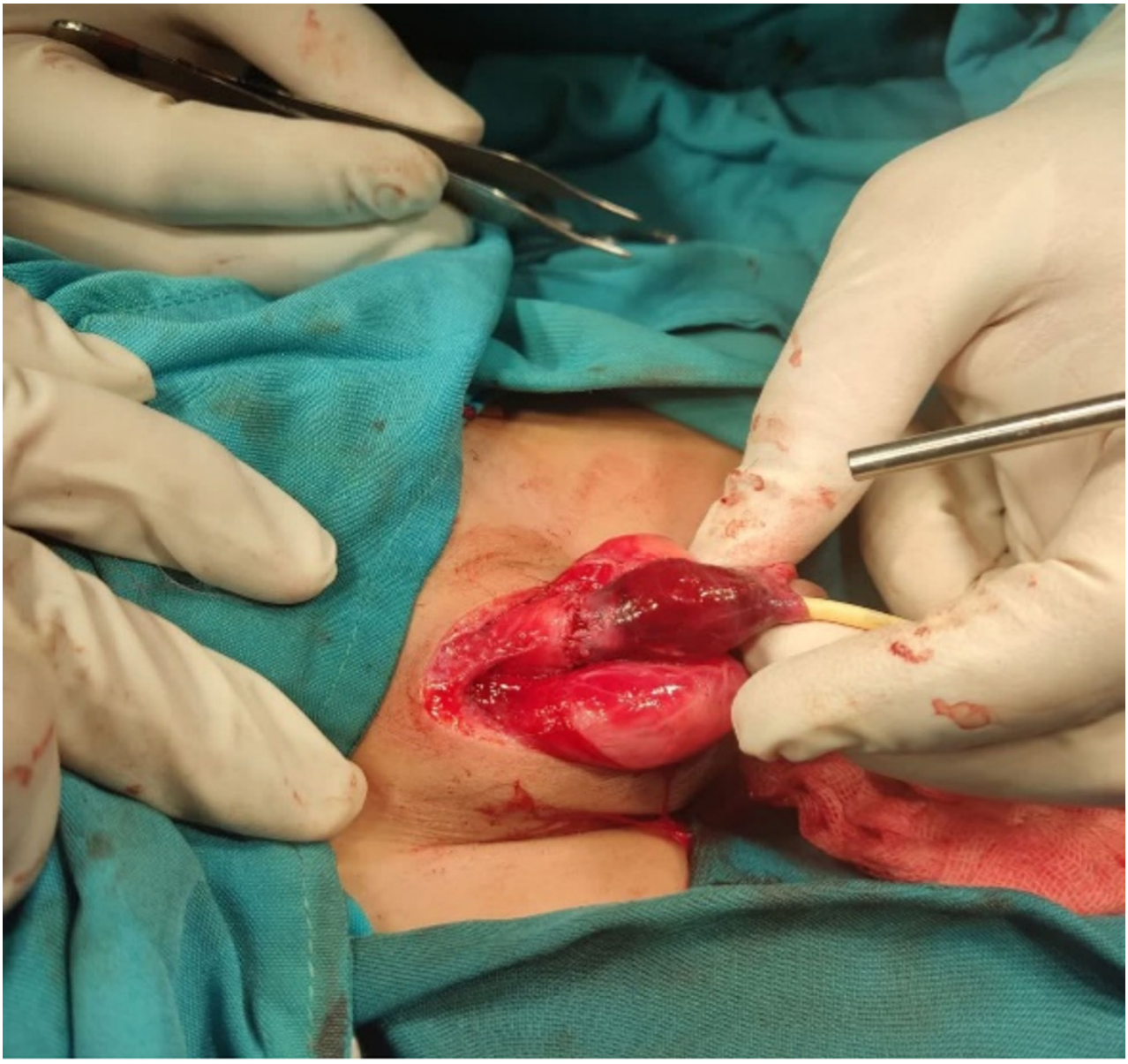


Fig. 3 Repairing Tunica albuginea circumferentially using interrupted 5-0 Vicryl sutures

valproate and risperidone were prescribed. The patient was also referred to a pediatric psychiatrist to evaluate the psychological impact of the event.

At one-month follow-up, the surgical wound had healed well, and the parents were satisfied with the cosmetic outcome. The child demonstrated normal spontaneous voiding with a good urinary stream. During physical examination, the child exhibited a behavioral response to gentle tactile stimulation of the penis. However, this observation should not be interpreted as evidence of recovery of penile sensation, and formal assessment of sensory function was not feasible because of the patient's age.

At the most recent follow-up, 38 months after surgery, the patient was 7 years old. Clinical examination demonstrated a satisfactory cosmetic appearance of the penis with complete wound healing and no evidence of skin loss, urethrocutaneous fistula, or significant scar contracture (Fig. 7). According to parental reports, the child voided with a normal urinary stream without urinary retention (Fig.7C), urinary tract infections, or other lower urinary tract symptoms. Parents also reported spontaneous penile erections without apparent penile deformity.

Compared with previously published pediatric cases, the present case represents one of the longest reported follow-up periods after successful macroscopic penile replantation performed without neurovascular



Fig. 4 Closing the scrotal laceration and penile skin with interrupted 4-0 Vicryl sutures



Fig. 5 A small area of glans necrosis was observed postoperatively

anastomosis, demonstrating durable cosmetic and functional outcomes over 38 months.

Timeline

A chronological summary of the patient's clinical course, surgical management, postoperative events, and follow-up is presented in Table 2.

Discussion

Penile amputation is an uncommon but devastating injury in children, and evidence regarding its optimal management remains limited because of the rarity of reported cases. Penile vascularization is derived from branches of the internal pudendal artery, including the dorsal and deep penile arteries, and the rich vascular network of the genitalia may contribute to tissue survival even in challenging circumstances [9, 10]. Prompt hemodynamic stabilization remains the priority in the management of severe penile trauma [11].

The etiology of pediatric penile amputation is heterogeneous and may include accidental trauma, assault, self-inflicted injury, or underlying psychiatric and metabolic disorders [12–15]. In pediatric patients, comprehensive multidisciplinary evaluation is essential, particularly



Fig. 6 Penile appearance on postoperative day 20 demonstrating resolution of glans necrosis after conservative management

when concerns regarding non-accidental trauma or possible abuse exist. Psychological assessment and appropriate social support should therefore be considered integral components of management.

Our patient sustained an AAST Grade IV penile injury, which is generally managed with surgical reconstruction [12, 16]. Although microsurgical replantation is considered the preferred technique because it enables restoration of arterial inflow, venous drainage, and neural continuity, it may not always be feasible in resource-limited settings or in very young children owing to the small caliber of neurovascular structures [13, 17]. In such circumstances, macroscopic replantation may still provide acceptable short-term cosmetic and functional outcomes.

Complications following penile replantation include skin necrosis, edema, wound infection, urethral stricture, sensory impairment, and erectile dysfunction [17]. Previous studies have demonstrated an inverse relationship between the number of re-anastomosed vessels and the incidence of skin necrosis. Nevertheless, some reports suggest that adequate perfusion may be re-established through residual corporeal tissues, including both the corpus spongiosum and corpora cavernosa [18]. In our case, conservative management was sufficient to achieve resolution of limited glans ischemia.

We also elected not to place a suprapubic catheter because there was no evidence of urinary leakage or bladder spasms during the postoperative period. Similar management strategies have been described in previous successful penile replantation reports [19].

The ultimate goals of penile replantation are preservation of penile appearance and restoration of urinary, sensory, and erectile function [20–22]. At the latest follow-up, 38 months after surgery, the patient

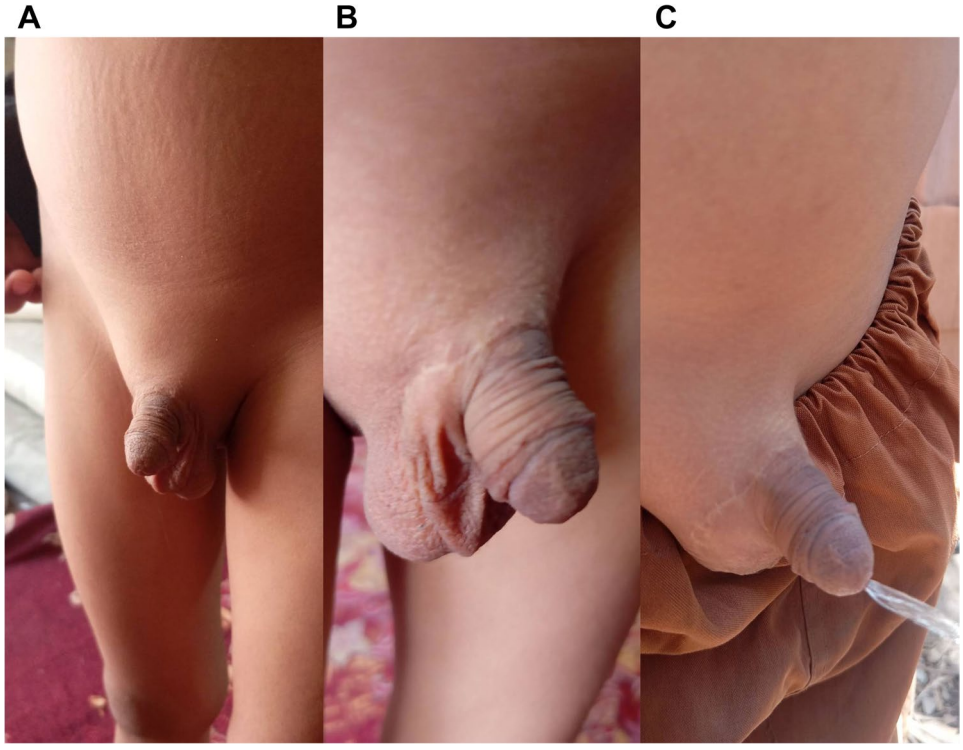


Fig. 7 **A** and **B** Penile appearance 38 months after macroscopic replantation, demonstrating a satisfactory long-term cosmetic outcome with preserved penile shaft and glans appearance, **C** Photograph showing the patient voiding 38 months postoperatively

Table 2 Timeline of the patient's clinical course

Time Point	Clinical Event
Approximately 9 h before admission	Near-total penile amputation occurred at home.
Initial management at a local hospital	Foley catheter insertion and wound stabilization.
Same day	Transfer to Shahid Bahonar Hospital Trauma Center.
Day 0	Macroscopic penile replantation and urethral reconstruction were performed.
Postoperative day 3	A small area of glans necrosis was observed and managed conservatively.
Postoperative day 8	Patient discharged in stable condition.
Postoperative day 20	Foley catheter removed.
38-month follow-up	Satisfactory cosmetic appearance on clinical examination (Fig. 7); normal voiding according to parental report; spontaneous penile erections reported by parents; no urinary complaints.

demonstrated a satisfactory cosmetic appearance, and the parents reported normal voiding without urinary complaints as well as spontaneous penile erections. However, because of the patient's prepubertal age, formal assessment of erectile function, penile sensation, and future sexual function is not yet feasible.

Comparison with previously published pediatric cases (Table 1) demonstrates that penile amputation requiring replantation remains an exceptionally rare injury in children, particularly in those younger than 5 years of age. Reported cases differ considerably with respect to the level of amputation, ischemia time, surgical technique, and duration of follow-up. Most published reports describe favorable short-term outcomes; however, objective long-term functional assessment is infrequently available. In comparison, the present case provides one of the longest reported clinical follow-ups after successful macroscopic penile replantation without neurovascular anastomosis, demonstrating sustained cosmetic integrity and satisfactory urinary function based on clinical examination and parental reports.

Several factors influence outcomes after penile replantation, including ischemia duration, mechanism and severity of injury, surgical technique, perioperative care, and institutional expertise [22, 23]. The principal limitation of this report is the lack of objective functional investigations during long-term follow-up [24]. Although a 38-month clinical follow-up demonstrated a stable cosmetic appearance and favorable urinary function according to parental reports, objective assessment of urethral patency by uroflowmetry or VCUG could not be performed because the family lives in a remote nomadic-rural area with severe socioeconomic limitations that prevented referral to our tertiary center. Therefore, long-term functional evaluation relies mainly on clinical examination and parental observations.

Abbreviations

AAST	American association for the surgery of trauma
FC	Foley catheter
IV	Intravenous

Supplementary Information

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Supplementary Material 1.

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Authors' contributions

Ali Kamalati and Mohammadamin Hesamarefi were involved in the clinical management of the patient and the surgical procedure. Fatemeh Doost-Mohammadi and Mohammadhadi Hesam -Arefi contributed to data collection, literature review, and manuscript preparation. Mohammadamin Hesamarefi, as the corresponding author, supervised the study, contributed to the study design, and critically revised the manuscript. All authors read and approved the final version of the manuscript.st Moha

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Data availability

No datasets were generated or analysed during the current study.

Declarations

Ethics approval and consent to participate

The participant was a child under 16 years of age. Written informed consent for participation and publication of this case report was obtained from the patient's parents in accordance with the principles of the Declaration of Helsinki. The patient's confidentiality and anonymity were maintained. Written informed consent for both publication and participation was obtained from the patient's parents. No person's identifiable data is included in the manuscript.

Competing interests

The authors declare no competing interests.

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References

1. Tolani MA, Webber R, Buckley L (2024) Penile Trauma Burden and Aetiology in the Paediatric and Adult Population: A Scoping Review and Critical Analysis of the Literature. J West Afr Coll Surg 14(1):5–16
2. Jordan G (2007) Management of penile amputation. Emergencies in Urology: Springer; pp. 270-5
3. Banihani OI, Fox JA, Gander BH et al (2014) Complete penile amputation during ritual neonatal circumcision and successful replantation using postoperative leech therapy. Urology 84:472–474. https://doi.org/10.1016/j.urology.2014.04.021
4. Khaireddine B, Adnen H, Khaled BM, Adel S (2014) Surgical reimplantation of penile glans amputation in children during circumcision. Urol Ann 6:85–87. https://doi.org/10.4103/0974-7796.127024
5. Patial T, Sharma G, Raina P (2017) Traumatic penile amputation: A case report. BMC Urol 17:93. https://doi.org/10.1186/s12894-017-0285-4.6
6. Soltani S, Mottaghi M, Jafarpisheh A, Tavakkoli M (2020) Penile glans amputation following circumcision: A case report of a rare complication. Case Rep Urol 2020:5806987. https://doi.org/10.1155/2020/5806987
7. Tawaranurak N, Attawettayanon W, Boonchai S, Chalieopanyarwong V, Chungsiriwattana W, Kongpanichakul L (2023) Successful Pediatric Penile Replantation Following Amputation During Ritual Circumcision: A Case Report and Literature Review. Am J Case Rep 24:e942448. https://doi.org/10.12659/AJCR.942448
8. Mishra B, Reddy BG, Kumar R (2026) Effective composite grafting of subcoronal penile amputation after ritual circumcision (Khatna) in a 3-year-old child. Urol Case Rep 66:103397
9. Sam PLC, Anatomy A, Pelvis P (2025) Treasure Island (FL): StatPearls Publishing; [Available from: https://www.ncbi.nlm.nih.gov/books/NBK482236/
10. Prieto D (2008) Physiological regulation of penile arteries and veins. Int J Impot Res 20(1):17–29
11. Liu H, Dong B, Wu X, Hua L, Zhang M, Li X et al (2025) Replantation following complete penile amputation: Summary of perioperative experience and treatment strategies. Andrology 13(6):1469–1483
12. Fazi J, Adkins D, Knight J, Luchey A (2019) Unusual Mechanisms of Penile Amputation. Case Rep Urol 2019:1582047
13. Pakmanesh H, Sharifian R, Ashabyamin M (2017) Different aspects of penile amputation: surgery, forensics, and psychiatry (case report and short review). Archives Trauma Res 6(4):101–104
14. Çiçek S, Şentürk E, Coşar B (2024) Klingsor Syndrome: Genital Self-Mutilation in a Psychotic Patient. Türk Psikiyatri Derg 35(3):248–250
15. Jathar P, Panse AM, Jathar M, Gawali PN (2016) Lesch-Nyhan Syndrome: Disorder of Self-mutilating Behavior. Int J Clin Pediatr Dent 9(2):139–142
16. Coccolini F, Moore EE, Kluger Y, Biffl W, Leppaniemi A, Matsumura Y et al (2019) Kidney and uro-trauma: WSES-AAST guidelines. World J Emerg Surg 14:54
17. De M, Dawar R (2022) The challenges and complications of re-implantation of the penis following amputation. Ghana Med J 56(1):51–54
18. Garcia KS, Becker GW, Gretzer MB (2023) Successful replantation of self-amputated penis using microvascular repair, resulting in restoration of voiding and erectile function. Urol Case Rep 46:102319
19. Raheem OA, Mirheydar HS, Patel ND, Patel SH, Suliman A, Buckley JC (2015) Surgical management of traumatic penile amputation: a case report and review of the world literature. Sex Med 3(1):49–53
20. Altan M, Hazir B, Baltaci KE, Bozaci AC, Haberal HB, Gudeloglu A et al (2022) Long-term complications of penile fracture repair: Erectile dysfunction and penile curvature. Rev Int Androl 20(2):116–120
21. Djordjevic ML, Bumbasirevic MZ, Krstic Z, Bizic MR, Stojanovic BZ, Miocinovic R et al (2014) Severe penile injuries in children and adolescents: reconstruction modalities and outcomes. Urology 83(2):465–470
22. Akhoondinasab MR, Farahmand HR, Zahedi A, Saraee A (2023) Successful Microsurgical Replantation of Amputated Penis: A Case Report and Review of Literature. World J Plast Surg 12(3):18–23
23. Yang K, Liu Y, Wang W, Xiao Y, Li X, Zhou L (2020) Successful penile replantation after macroscopic repair using vein blood-letting therapy. Urol Case Rep 28:101069
24. Derakhshan R, Doost Mohammadi F (2025) Successful percutaneous closure of a large ventricular septal defect (VSD) in a 9-month-old Infant: A case report. ARYA Atherosclerosis Journal 21(5):4–8. https://doi.org/10.48305/arya.2025.43587.3042

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